Contents of reply

(1) Judgment of PCT written opinion

According to the PCT written opinion, claims 1, and 4 to 8 of this application are judged to lack novelty and an inventive step on account of US 6010908 A (document 1). Further, they are judged to lack an inventive step also on account of US 2002/0160514 A1 (document 2), Hum. Mol. Genet., 1998, Vol. 7, No. 12, pp. 1913-1919 (document 3) and Mol. Ther. February 2001, Vol. 3, No. 2, pp. 178-185 (document 4).

Further, claims 2 and 9 of this application are judged to lack an inventive step on account of the above documents 1 to 4 and Anal. Biochem., 1997, Vol. 254, pp. 157-178 (document 5).

On the other hand, claim 3 of this application is judged to be novel and to involve an inventive step over the above documents 1 to 5, and J. Clin. Invest., September 2003, Vol. 112, No. 5, pp. 637-641 (document 6), and Trends Biochem. Sci., April 2000, Vol. 25, pp. 156-165 (document 7).

(2) Novelty

The invention of claims 1, and 4 to 8 of this application is characterized by a "single-stranded DNA fragment, which is prepared from a single-stranded circular DNA, is homologous with the target DNA sequence and contains the base(s) to be converted". Only this single-stranded DNA fragment (a sense strand or an antisense strand) can be allowed to act on a target DNA sequence. According to the invention of claims 1, and 4 to 8 of this application having such a characteristic feature, the base conversion efficiency can be improved compared with conventional methods.

On the other hand, in the document 1, a method of converting a base by preparing a single-stranded linear DNA and introducing the resulting single-stranded linear DNA into a cell is described. The examiner has pointed out that there is a description regarding a "single-stranded circular DNA" in Examples 11, 18 and 19 from 7th column to 12th column of document 1. However, when the present applicants examined these, they found no such description.

The "single-stranded DNA" in the document 1 is one obtained by thermal denaturation of a PCR product, and both sense strand and antisense strand are allowed to act on a target DNA sequence. Therefore, it is not a "single-stranded DNA fragment prepared from a single-stranded circular DNA" as the invention of claims 1 and 4 to 8 of this application, and their constitutions and the like are obviously different from each other. Accordingly, even if the document 1 which is obviously different as described above is consulted, the invention of claims 1 and 4 to 8 of this application cannot be easily conceived.

Such being the case, the present applicant is convinced that the invention of claims 1 and 4 to 8 of this application is sufficiently novel and involves an inventive step over the document 1.

(3) Inventive step

(A) Invention of claims 1 and 4 to 8 of this application

In any of the documents 2 to 4, a method of converting a base by preparing a single-stranded linear DNA and introducing the resulting single-stranded linear DNA into a cell is disclosed in the same manner as in the above document 1.

However, in the same manner as in the above document 1, the "single-stranded DNA" in the documents 2 to 4 is one obtained by thermal denaturation of a PCR product (a single-stranded linear DNA), and both sense strand and antisense strand are allowed to act on a target DNA sequence. The invention of claims 1 and 4 to 8 of this application is characterized by a "single-stranded DNA fragment prepared from a single-stranded circular DNA" as described above. Therefore, it is different from the documents 2 to 4 and moreover, there is no description or suggestion regarding this characteristic feature of this invention in these documents.

Further, the "single-stranded DNA fragment" in the document 2 is utilized in the preparation of an expression vector system for confirming the DNA introduction efficiency, not in a "method of converting a base" as the invention of claims 1 and 4 to 8 of this application. Therefore, the present applicant believes that the problems addressed or objects of the inventions are completely different.

Further, by using the "single-stranded linear DNA prepared from a single-stranded circular DNA", the invention of claims 1 and 4 to 8 of this application succeeded in improving the base conversion efficiency compared with the case of using a conventional, for example, "single-stranded linear DNA obtained by thermal denaturation of a PCR product" as described in the document 3 or 4.

As described above, even if the documents 2 to 4 are consulted, it is extremely difficult even for a person skilled in the art to conceive the idea of using a "single-stranded linear DNA prepared from a single-stranded circular DNA", which is significantly different in terms of properties, origins and the like

from a conventional "single-stranded linear DNA obtained by thermal denaturation of a PCR product" in order to improve the base conversion efficiency.

Accordingly, the present applicant believes that the invention of claims 1 and 4 to 8 of this application sufficiently involves an inventive step over the documents 2 to 4.

(B) Invention of claims 2 and 9 of this application

The invention of claims 2 and 9 of this application is characterized by defining that the "single-stranded circular DNA is a phagemid DNA".

The examiner has denied the inventive step of the invention of claims 2 and 9 of this application on account of the document 5 in addition to the above documents 1 to 4. This document 5 relates to a method of preparing a mutant DNA and describes the use of a phagemid vector (phagemid DNA) for preparing a template single-stranded DNA.

However, the "single-stranded DNA" prepared from the phagemid vector (phagemid DNA) described in the document 5 is strictly intended to be used only as a template for PCR, therefore, it is completely different from that in the invention of claims 2 and 9 of this application. Further, there is no description or suggestion in the document 5 that the base conversion may be carried out by introducing such a single-stranded DNA per se in a cell and allowing mutual replacement to proceed as in the invention of claims 2 and 9 of this application.

As described above, the present applicant believes that even a person skilled in the art cannot easily conceive the invention of claims 2 and 9 of this application even if the documents 1 to 4 which are different as described above

are further applied in addition to the document 5 which is obviously different from the invention of claims 2 and 9 of this application.

(4) Summary

As described in detail hereinabove, the present applicant believes that all of the inventions of claims 1 to 9 of this application are sufficiently novel and involve an inventive step over the above documents 1 to 7.